ELECTRONIC FILING SYSTEMS

CLAIM(S)

1) An electronic filing system comprising an image input means for inputting one or more pages of document/image data, an image storing means for storing in memory device the image data input by said image input means, an image reduction means for creating reduced data by reducing the image data stored by said storing means, and a display means for simultaneously displaying multiple files of the reduced data reduced by said reducing means, and being characterized in that the system also has a page turning means, by which the pages containing reduced image data displayed by said display means is switched.

2) An electronic filing system, as mentioned in Claim 1, wherein said page turning means is characterized by its having page turning means 1 that turns the pages containing the reduced image data page by page.

3) An electronic filing system, as mentioned in Claim 1, wherein said page turning means is characterized by its having page turning means 2 that simultaneously turns multiple pages containing the reduced image data.

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4) An electronic filing system, as mentioned in Claim 1, wherein said page turning means has page turning means 1 that turns the page containing the reduced image data page by page and page turning means 2 that simultaneously turns multiple pages containing the reduced image data displayed by said display means.

5) An electronic filing system comprising an image input means for inputting one or more pages of document/image data, an image storing means for storing in memory device the image data input by said image input means, an image reduction means for creating reduced data by reducing the image data stored by said storing means, and a display means for simultaneously displaying multiple files of the reduced data reduced by said reducing means, characterized in that the system also has a multiple pages-display means that simultaneously displays multiple pages of one file containing the reduced image data displayed on the display device.

DETAILED DESCRIPTION OF THE INVENTION

(0001)

(Field of Industrial Application)

The present invention pertains to a retrieval system for an electronic filing system, wherein documents/images once recorded and stored to be used again.

(0002)

(Prior Art)

In the prior art method to retrieve images that have once been recorded in electronic filing system, a technique to use keywords has been used. There also is other retrieval technique to display recorded images on a display device, or a technique, whereby a portion of images is recorded as an image index at the time of image input, and the index is used for a means to retrieve images. This search/retrieval technique using the displayed images is frequently used in combination with a technique using keywords. With keyword search, it is difficult to integrate necessary images into one image, so after multiple images have been retrieved by keyword search, displayed, and recognized, the final search is performed. A technique to display images once is not only used with combination with keywords, but also is frequently used as a means to search necessary images in a final step.

(0003)

(Problems of the Prior Art to Be Addressed)

As for a technique to display images for search/retrieval, images are generally displayed on display device. But the area to display images is limited, so a technique to display partial images is used, as shown in Fig. 10. In the technique shown in Fig. 10, images are only displayed partially, so the screen needs to be scrolled in order to confirm an entire image. The problem with this is that only one image can be displayed on one screen.

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(0004)

As a method to solve the problem illustrated in Fig. 10, there is a method to display a reduced image, as shown in Fig. 11. With the method illustrated in Fig. 11, however, only the images on a first page are used for search/retrieval even if images are contained in a few pages, so the second page and the subsequent pages cannot be used for retrieval.

(0005)

The present invention, to solve the aforementioned problem, aims to present a search/retrieval method for displaying multiple reduced images, wherein an image as a mean to search/retrieval is not limited to a first page but any selected page can be used for search/retrieval.

(0006)

(Means to Solve the Problems)

The electronic filing system of the present invention comprises: an image input means to input document/image data composed of one or more pages; an image storing means to store in a memory device the image data input by said image input means; an image reducing means to create the reduced image data by reducing the image data stored by said image storing means; a display means to simultaneously display on a display device multiple files of the reduced image data reduced by said image reducing means; page turning means 1 to display pages

containing the reduced image page by page; page turning means 2 to simultaneously switch the multiple pages containing the displayed data; a multiple pages-display means to simultaneously display on a display device multiple pages of reduced images in one file.

(0007)

(Embodiment)

An embodiment of the present invention is explained below with reference to the drawings. Fig. 2 shows a block diagram of the electronic filing system of the present invention. This electronic filing system comprises: CPU 10 for executing each process; ROM 20 for recording each process by each means a processing program; RAM 30 for temporarily recording the result of each process; image input device 40 such as a scanner; hard disk; magneto-optical disk; floppy disk; magnetic tape; external memory device 41 such as an IC memory card; display device 42 for displaying; a command input device such as a mouse.

(0008)

Fig. 3 shows a flowchart of the steps of inputting one or more pages of image data into image input device 40 and of recording in external memory device 41.

(0009)

A step of inputting images (2100) by using the image input means is explained.

The step of inputting images (2100) is performed by the operator by using the image input device 40. More specifically, by the operator's command to input images, the CPU controls to input the document/images into the image input device 40.

(0010)

A step of storing images (2200) using the image storing means is explained below. In the step of storing images (2200), the image data input in the image input step (2100) is recorded in an external memory device 41. At this time, the operator may attach a keyword or control number to each image data for use for search/retrieval. In the image storing step (2200), the image data may be compressed into codes prior to recording.

(0011)

Subsequently, a step of reducing images (2300) using an image reduction means is explained below. In the step of reducing images (2300), multiple image data recorded in the external memory device 41 are output, reduced into a specific size, and input again into the external memory 41. If the image data output from the external memory device 41 are smaller than the specific size, the image data need not be reduced.

(0012)

In the image storing step (2200), if the images are stored after being codified by algorithm into hierarchical codes (e.g., Joint Bi-level Image Group), the images

are automatically stored together with various sizes of images. At this time, the step

of image reduction (2300) is incorporated into the step of compression codification

that is performed in the image storing step (2200).

(0013)

      Fig. 1 shows a flowchart indicating that the image data recorded in the

external memory device 41 are displayed on the display device 42, and the desired

image is retrieved by switching the image data by the operator's operation of the

commanding device 43.

(0014)

      A step of displaying (2400) using the display means is explained with

reference to Fig. 4. In the step of displaying (2400), the multiple reduced image data

stored in the external memory device 41 in the step of image reducing step (2300)

are output and displayed on the display device 42. Fig. 4 shows a diagram of the

display screen on the display device 42 in the step of displaying (2400). Six reduced

images are displayed here. The reduced images displayed on the screen are called

image $\alpha 1$ (2403), image $\beta 1$ (2404), image $\gamma 1$ (2405) from the upper left one to the

upper right one, respectively, and image $\sigma 1$ (2406), image -1 [illegible] (2407), imge -

1 [illegible] (2408) from the lower left to the lower right, respectively. The button

"next page" (2601) and "black page" (2602) are explained later.

(0015)

In this example, the number of images that can be displayed on the display device is 6 (In Fig. 4, N =6). If all of the reduced image data recorded in the external memory device 41 cannot be displayed, the N number of reduced images first recorded in the external device 41 are displayed. When button "next" 2401 is designated by the commanding device 43, the subsequent N number of reduced images are displayed. When "back" 2402 is designated, the preceding N number of reduced imaged are displayed. Thus, multiple pages of image data are confirmed. (0016)

If many images are recorded, a keyword may be attached to each data, and in the step of displaying (2400), only the images attached with the keyword may be displayed.

(0017)

Subsequently, a step of image selection (2500) is explained with reference to Fig. 4 and Fig. 5. In the step of image selection (2500), the images contained in the page to be turned in the page turning process are selected. More specifically, when the operator indicates a specific reduced image by using command device 43, a marker is attached to the reduced image to indicate the image selected.

(0018)

Fig. 5 illustrates the result of designating the image β 1 (2404) by the

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commanding device 43 under the condition shown in Fig. 4. If a mouse is used as the

commanding device 41, the left button of the mouse is clicked on the selected image.

The image selected by clicking the mouse displays the marker 2501 indicating that

the image has been selected. In Fig. 5, a black square mark is placed as a marker on

the lower right part of the selected image. To indicate the selection, the image may

be framed with a double frame or black-white inversion may be used.

(0019)

       If the selection of image needs to be canceled when a wrong image is selected,

the right button of the mouse is clicked on the wrong image. For example, when the

right button is clicked on the image $\beta1$ (2404) in the status of Fig. 5, the selection of

said image is canceled, and the screen returns to the status of Fig. 4.

(0020)

       Subsequently, a page turning process is explained with reference to Fig. 5 and

Fig. 6. In the step of turning pages (2600), the page containing the image selected in

the image selection step (2500) is switched. More specifically, when the operator

designates the button "next-page" 2601 by using the commanding device 43, the

selected image data in the subsequent page is output from the external memory

device 41 and displayed on the display device 42.

(0021)

       Fig. 6 indicates the result of executing the page turning process (2500) by the

operator's commanding "next-page" 2601 by use of commanding device 43. The page containing image β1 (2404) selected in Fig. 5 is turned, and the next page containing image β2 (2603) is displayed. At this time, other image is not changed. Moreover, whenever the button "next-page" 2601 is designated by the commanding device 43, the page is turned to β3, β4, ... If the button "black-page" 2602 is selected, the page preceding the page containing the selected image is displayed, so the screen resumes the status of Fig. 5.

(0022)

Fig. 7 illustrates the result of selecting by the commanding device 43 image α1 (2403), image β2 (2603), and image σ1 (2406) under the status when image β2 (2501) has been selected. The image β2 (2501) selected is retained, and the image α1 (2403) and image δ1 (2406) selected are added.

(0023)

Fig. 8 illustrates the result of execution of the page turning process (2600) in the status of Fig. 7. The selected images, image α1 (2403), image β2 (2603), and image δ1 (2406), are updated in the subsequent page, so image α2 (2604), image β2 (2603), and image δ2 (2606) are displayed.

(0024)

In the above example, the reduced image data were always output from the external memory device 41 in the above example, but it is also possible that, in order

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to accelerate the process, all the reduced images displayed on the display device 42 are temporarily input into RAM 30 when the button "next-page" 2601 is designated, and the reduced image data may be output from RAM 30 when the button "back-page" 2602 is designated.

(0025)

Subsequently, a multiple pages-display process (2700) is explained with reference to Fig. 4 and Fig. 9. In the process of displaying multiple pages, multiple pages containing the images designated by the commanding device 43 are displayed. More specifically, when the operator designates the desired reduced image by using the commanding device 43, multiple pages containing the designated reduced image data are output from the external memory device 41 and displayed on the display device 42. An image selection process (2500) is performed by designating a specific image. For example, when the upper portion of the image is designated by the commanding device 43, the image selection process (2500) is performed, and when the lower portion of the image is designated, the multiple pages display process (2700) is performed.

(0026)

Fig. 9 illustrates the result of the operator's designating the image $\beta1$ (2404) in the status of Fig. 4 by using the commanding device 43. If a mouse is used as the commanding device 43, the left button of the mouse is clicked on the reduced image

to designate the image (clicked on the lower half of the image). Then, by multiple pages display process (2700), image β1 (2404), image β2 (2603), image βm (2404), and ... (m=6) are displayed on the display device 42. If all the pages cannot be shown in the display screen, the button "next" 2401 is designated to display the subsequent page m, and button "back" 2402 is designated to display the preceding page m. In Fig. 9, the buttons, "next-page" 2601, "back-page" 2502, are omitted since they are not operated here, and the button "L-quit" 2701 is displayed. When multiple pages no longer need to be displayed, the operator designates the button "L-Quit" 2701, and the display of multiple pages ends. At this point, the reduced image data displayed on the screen prior to the execution of multiple pages display process (2700) is again output from the external memory device 41 and displayed, the screen resumes the status of Fig. 4.

(0027)

In the above example, the reduced image data to be displayed were always output from the external memory device 41 in the above example, but it is also possible that, in order to accelerate the process, all the reduced images displayed on the display device 42 are temporarily stored in RAM 30 prior to switching to the display of multiple pages by the multiple page display process (2700), and the reduced image data are output from the RAM 30 when the button "L-QUIT" 2701 is designated.

(0028)

In multiple pages display process (2700), the screen of Fig. 9 appears even if each of images $\beta 1$ (i=1,2,3) (2404, 2503, 2604) is designated, and by designating "L-QUIT" 2701, the screen prior to the execution of multiple pages display process can be resumed.

(0029)

In the embodiment example of the present invention, each process is recorded in ROM as a program, but the process may be performed by a dedicated hardware.

(0030)

The reduced image data was preliminarily recorded in the external memory device 41 in the above example, but it may be generated from each image at the time of retrieval.

(0031)

(Advantage of the Invention)

As explained above, by the system of the present invention, the retrieval/search can be performed not only by a first page but also by the subsequent pages.

(0032)

Since all pages can be turned, the images in a specific pages, such as a second page or third page, can be retrieved.

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(0033)

Multiple images can be displayed on one same page, so even when the characteristics of all the images to be retrieved are not found on the first page, the retrieval using a more appropriate clue becomes possible. For example, as in Examined Published Patent Application, wherein the drawings are in the last page, the drawings can be used as a clue.

(0034)

Since the desired image can be retrieved/searched page by page, recognition of images on the second page and the subsequent pages can be easily done on the retrieved screen. In addition, multiple pages containing images can be turned, the multiple images contained in the page can be compared.

(0035)

Multiple pages can be recognized, so when multiple drawings illustrated in multiple pages need to be examined, or when the layout of the document/images needs to be examined, this system is very convenient.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows a flowchart indicating the steps of retrieval process in embodiment example. Fig. 2 shows a block diagram of one embodiment example of the present invention. Fig. 3 shows a flowchart of the steps of storing images in the embodiment example. Fig. 4 shows the initial display screen in the embodiment of

the present invention. Fig. 5 shows the display screen when the image is selected. Fig. 6 shows the display screen when the pages are turned. Fig. 7 indicates the displayed screen when the selected image is added. Fig. 8 indicates the display screen when the pages are turned. Fig. 9 shows the screen on which multiple pages are displayed. Fig. 10 shows example 1 of the retrieved screen by the prior art method. Fig. 11 shows example 2 of the retrieved screen by the prior art method.

10. CPU

20. ROM

30. RAM

40. Image input device

41. External memory device

42. Display device

43. Commanding device

(2100) Image input process

(2200) Image storing process

(2300) Image reduction process

(2400) Display process

(2500) Image selection process

(2600) Page turning process

(2700) Multiple page display process